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EXAMINER

ARANCIBIA, MAUREEN GRAMAGLIA

ART UNIT PAPER NUMBER

1763

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/736,783

Applicant(s)

HONJOU ET AL.

Examiner

Maureen G. Arancibia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 September 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-12,14-21 and 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-12,14-21 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7 September 2006 has been entered.

Claim Objections

2. **Claim 24 is objected to because of the following informalities:** There is a typographical error on the last line of the claim. For the purposes of the following examination on the merits, the last line of the claim has been interpreted as reading "expansion of the other piece" (i.e. the piece referred to as "another piece" on the previous line of the claim). Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claims 1, 2, 4-12, and 14-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Specifically, the recitation in independent claims 1 and 11 of "a plurality of pieces formed in relation to a distribution of temperatures in the...chamber at a time of plasma

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processing,” and the recitation that “each of the plurality of pieces is shorter in axial length than a piece disposed at a location where a gradient of the temperatures at the time of the plasma processing is smaller” render the claims indefinite. The distribution of temperatures in the plasma or sample chamber, and the distribution of temperature gradients, may vary in the claimed apparatus, depending, for example, on the presence and use of additional structural components (i.e. heaters; the presence of a conduit putting the sample chamber in communication with the plasma chamber), the type of processing performed using the apparatus, environmental factors, or the length of time processing has already been performed up to the point referred to as “the time of plasma processing.” There is no clear standard for determining where in the claimed apparatus the temperature would be greater or smaller. In sum, these recitations have no fixed meaning, and therefore make the claims indefinite. Appropriate correction and clarification are required.

The remaining claims are rejected due to their dependence on the independent claims.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1, 2, 6-8, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of U.S. Patent 6,613,587 to Carpenter et al.

In regards to Claim 1, AAPA teaches a plasma processing apparatus (Figure 1), comprising: a plasma chamber 607 in which a high-density plasma is generated; a sample chamber 601 in communication with the plasma chamber for housing a sample 603 to be processed using the plasma; and a protection tube 620 for protecting an inner wall of the plasma chamber from deposition of a product that results from the plasma processing.

AAPA does not expressly teach that the protection tube is composed of a plurality of pieces.

Carpenter et al. teaches that a protection tube 30 is composed of a plurality of pieces 31-38 that can differ in length. (Figure 2)

It would have been obvious to one of ordinary skill in the art to modify the protection tube taught by AAPA for it to be composed of a plurality of pieces of varying length. The motivation for making such a modification, as taught by Carpenter et al. (Column 1, Lines 45-57; Column 4, Lines 5-22), would have been to allow damaged sections of the protection tube to be replaced without having to replace the entire protection tube and without having to disassemble the plasma chamber. One of ordinary skill in the art would have been further motivated to vary the lengths of the plurality of pieces in the manner taught by Carpenter et al. in order to differentiate them

from each other, and to make sure that the damaged sections are replaced with the matching replacements.

The recitation that the plurality of pieces is formed in relation to a distribution of temperatures in the plasma chamber at a time of plasma processing, and the recitation that each of the plurality of pieces is shorter in axial length than a piece disposed at a location where a gradient of temperatures at a time of plasma processing is smaller are process limitations, not structural recitations as Applicant asserts. The distribution of temperatures and the distribution of temperature gradients would depend, among other factors, on the presence and/or use of additional structural components (i.e. heaters; the presence of a conduit putting the sample chamber in communication with the plasma chamber), the type of processing performed using the apparatus, environmental factors, or the length of time processing has already been performed up to the point referred to as "the time of plasma processing." Moreover, as discussed above in the rejection under 35 U.S.C. 112, second paragraph, not only are these process limitations, but also limitations with no definite or fixed meaning.

It has been held that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). See MPEP § 2114. See also *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971); *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531

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(CCPA 1959); and *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

In this case, the combination of AAPA and Carpenter et al. teaches the structural limitations of a protection tube comprising a plurality of pieces disposed in an axial direction, and varying in length. This structure meets all of the *structural limitations* of the claim. The apparatus taught by the combination of AAPA and Carpenter et al. would be capable of being operated in such a way and with various environmental conditions and process settings, so as to generate any number of distributions in temperature and temperature gradient, which in turn would be capable of corresponding to a given arrangement of the axial segments of the protection tube.

In regards to Claim 2, AAPA teaches that the plasma chamber 607 and the protection tube 620 are tubular in shape (Figure 1). The combination of AAPA and Carpenter et al. teaches that the plurality of pieces are tubular members disposed in an axial direction of the protection tube to comprise the protection tube.

In regards to Claim 6, AAPA teaches that the protection tube is made of quartz. (Specification, Page 4, Line 1)

In regards to Claims 7 and 8, AAPA teaches that the apparatus is an electron cyclotron resonance plasma apparatus that subjects the sample to sputtering. (Specification, Page 2, Line 2)

In regards to Claim 24, the combination of AAPA and Carpenter et al. does not expressly teach how the plurality of pieces of the protection tube are coupled to each other.

Carpenter et al. additionally teaches that the plurality of pieces of protection tube 30 can coupled with tongue and groove interconnections (Figure 2; Column 4, Lines 34-36), as broadly recited in the claim.

It would have been obvious to one of ordinary skill in the art to modify the combination of AAPA and Carpenter et al. to have the pieces of the protection tube be coupled to each other via tongue and groove interconnections. The motivation for doing so, as would have been apparent to one of ordinary skill in the art at the time of the invention, would have been to allow for easy alignment, assembly, and disassembly of the liner pieces.

The tongue and groove interconnections taught by the combination of AAPA and Carpenter et al. would so couple each of the plurality of pieces to another piece so as not to prevent the expansion of the other piece, *as broadly recited in the claim*. The tongue and groove interconnection would still allow at least a small amount of thermal expansion of each piece in some direction at some point along the length of the piece, which is all that is required by the limitation broadly recited in the claim.

7. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Carpenter et al. as applied to claim 1 above, and further in view of U.S. Patent 6,797,639 to Carducci et al.

The teachings of AAPA and Carpenter et al. were discussed above.

In regards to Claims 4 and 5, the combination of AAPA and Carpenter et al. does not expressly teach that the protection tube is provided with a plurality of grooves on the

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inner wall thereof in parallel with an axis of the protection tube at substantially equal circumferential intervals (i.e. evenly spaced longitudinal grooves).

Carducci et al. teaches that a protection tube 118 can be provided with evenly spaced longitudinal grooves 1810. (Figure 20; Column 18, Lines 1-2)

It would have been obvious to one of ordinary skill in the art to modify the combination of AAPA and Carpenter et al. to provide the protection tube with a plurality of evenly spaced longitudinal grooves on the inner wall thereof. The motivation for making such a modification, as taught by Carducci et al. (Column 16, Line 33 - Column 17, Line 39), would have been to increase adhesion of deposited films on the protection tube and thereby reducing flaking of such films into the chamber and subsequent substrate contamination or damage.

8. Claims 9-12 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Carpenter et al. as applied to claims 1-3 and 6-8 above, and further in view of U.S. Patent 6,408,786 to Kennedy et al.

The teachings of AAPA and Carpenter et al. were discussed above in regards to Claim 1.

In regards to Claims 9 and 10, the combination of AAPA and Carpenter et al. does not expressly teach that the plasma is an inductively coupled plasma or a helicon wave plasma.

Kennedy et al. teaches that ECR, inductive coupling, and helicon wave are equivalent means of generating plasma.

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It would have been obvious to one of ordinary skill in the art to select any of ECR, inductive coupling, or helicon wave as art-recognized equivalent means to generate a plasma. It has been held that an express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious.

In re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982).

In regards to Claim 11, AAPA does not expressly teach that a protection tube can be disposed in the sample chamber.

Kennedy et al. teaches that a tubular protection tube 20 can be disposed in a sample chamber 2.

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by AAPA to dispose a protection tube in the sample chamber. The motivation for doing so, as taught by Kennedy et al. (Column 1, Lines 56-58), would have been to protect the walls of the *sample* chamber.

The combination of AAPA and Kennedy et al. does not expressly teach that the protection tube is composed of a plurality of pieces.

Carpenter et al. teaches that a protection tube 30 is composed of a plurality of pieces 31-38 that can differ in length. (Figure 2)

It would have been obvious to one of ordinary skill in the art to modify the protection tube taught by the combination of AAPA and Kennedy et al. for it to be composed of a plurality of pieces of varying length. The motivation for making such a modification, as taught by Carpenter et al. (Column 1, Lines 45-57; Column 4, Lines 5-22), would have been to allow damaged sections of the protection tube to be replaced

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without having to replace the entire protection tube and without having to disassemble the plasma chamber. One of ordinary skill in the art would have been further motivated to vary the lengths of the plurality of pieces in the manner taught by Carpenter et al. in order to differentiate them from each other, and to make sure that the damaged sections are replaced with the matching replacements.

The recitation that the plurality of pieces is formed in relation to a distribution of temperatures in the sample chamber at a time of plasma processing, and the recitation that each of the plurality of pieces is shorter in axial length than a piece disposed at a location where a gradient of temperatures at a time of plasma processing is smaller are process limitations, not structural recitations as Applicant asserts. The distribution of temperatures and the distribution of temperature gradients in the sample chamber would again depend, among other factors, on the presence and/or use of additional structural components (i.e. heaters; the presence of a conduit putting the sample chamber in communication with the plasma chamber), the type of processing performed using the apparatus, environmental factors, or the length of time processing has already been performed up to the point referred to as "the time of plasma processing." Moreover, as discussed above in the rejection under 35 U.S.C. 112, second paragraph, not only are these process limitations, but also limitations with no definite or fixed meaning.

It has been held that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the

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structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). See MPEP § 2114. See also *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971); *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959); and *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

In this case, the combination of AAPA, Kennedy et al., and Carpenter et al. teaches the structural limitations of a protection tube in the sample chamber comprising a plurality of pieces disposed in an axial direction, and varying in length. This structure meets all of the *structural limitations* of the claim. The apparatus taught by the combination of AAPA, Kennedy et al., and Carpenter et al. would be capable of being operated in such a way and with various environmental conditions and process settings, so as to generate any number of distributions in temperature and temperature gradient, which in turn would be capable of corresponding to a given arrangement of the axial segments of the protection tube.

In regards to Claim 12, AAPA teaches that the sample chamber 601 is tubular. (Figure 1) The combination of AAPA, Kennedy et al., and Carpenter et al. teaches that the plurality of pieces are tubular members disposed in an axial direction of the protection tube to comprise the protection tube.

In regards to Claim 16, the combination of AAPA, Kennedy et al., and Carpenter et al. just discussed does not expressly teach that the protection tube in the sample chamber is made of quartz.

AAPA teaches that a protection tube can be made of quartz. (Specification, Page 4, Line 1)

It would have been obvious to one of ordinary skill in the art to form the protection tube in the sample chamber out of quartz, as well. The motivation for doing so would have been to select an art-recognized (AAPA) suitable material for manufacturing the protection tube.

In regards to Claims 17 and 18, the apparatus taught by combination of AAPA, Carpenter et al., and Kennedy et al. would be inherently capable of subjecting the sample to etching or chemical vapor deposition, based on the process conditions. This rejection is based on the fact the apparatus structure taught above has the inherent structural capability of being used in the manner intended by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

In regards to Claim 19, see the discussion of Claim 8 above.

In regards to Claims 20 and 21, see the discussion of Claims 9 and 10 above.

9. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Carpenter et al., and further in view of Kennedy et al. as applied to claim 11 above, and further in view of Carducci et al.

The teachings of AAPA, Carpenter et al., and Kennedy et al. were discussed above.

In regards to Claims 14 and 15, the combination of AAPA, Carpenter et al., and Kennedy et al. does not expressly teach that the protection tube is provided with a

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plurality of grooves on the inner wall thereof in parallel with an axis of the protection tube at substantially equal circumferential intervals (i.e. evenly spaced longitudinal grooves).

Carducci et al. teaches that a protection tube 118 can be provided with evenly spaced longitudinal grooves 1810. (Figure 20; Column 18, Lines 1-2)

It would have been obvious to one of ordinary skill in the art to modify the combination of AAPA, Carpenter et al., and Kennedy et al. to provide the protection tube with a plurality of evenly spaced longitudinal grooves on the inner wall thereof. The motivation for making such a modification, as taught by Carducci et al. (Column 16, Line 33 - Column 17, Line 39), would have been to increase adhesion of deposited films on the protection tube and thereby reducing flaking of such films into the chamber and subsequent substrate contamination or damage.

Response to Arguments

10. Applicant's arguments filed 7 September 2006 have been fully considered but they are not persuasive.

In regards to Applicant's arguments against the rejection under 35 U.S.C. 112, second paragraph, these arguments are not persuasive. The Examiner maintains that the recitations in independent claims 1 and 11 of "a plurality of pieces formed in relation to a distribution of temperatures in the...chamber during the plasma processing," and the recitation that "each of the plurality of pieces is shorter in axial length than a piece disposed at a location where a gradient of the temperatures during the plasma processing is smaller" render the claims indefinite.

Contrary to Applicant's assertion, the Examiner has discharged the initial burden of providing a basis in fact *and/or cogent technical reasoning* to support the ultimate legal conclusion that one of ordinary skill in the art would not be able to ascertain the scope of protection defined by the claims, when reasonably interpreted in light of and consistent with the supporting specification. Specifically, the Examiner has provided *cogent technical reasoning* supporting the rejection, as set forth above.

Applicant argues that even if a temperature distribution in a plasma or sample chamber varies in each plasma processing apparatus, persons skilled in the art can determine the temperature distribution and properly set up a suitable protection tube in the apparatus. This argument is not convincing. The Examiner maintains that one of ordinary skill in the art would not be able to determine the temperature gradient distribution in accordance with the claims, since the temperature gradient distribution can actually change based on the choice of whether to turn on or off apparatus components such as heaters, on the type of processing performed, and on the length of time that has elapsed into plasma processing. One of ordinary skill in the art would still have no standard for determining what time is referred to as "during the plasma processing." The distribution of temperature gradients may change based on how the plasma is ignited, whether the plasma has only just been ignited or if thermal equilibrium has already been attained, etc. Again, there is no clear standard for determining where in the claimed apparatus the temperature gradient would be greater or smaller. The amendment to the claims to recite the distribution of temperatures "during" the plasma processing rather than "at a time of" the plasma processing does not alleviate this issue.

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In other words, one of ordinary skill in the art would not be able to determine whether a particular apparatus assembly met the limitations of the apparatus recited in the claims at any given point in time.

In regards to Applicant's arguments relying on *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, F.2d 1565, 1 USPQ2d 1081 (Fed. Cir. 1986), these arguments are not convincing. The situation in the instant application is materially different from the situation in *Orthokinetics*. In *Orthokinetics*, one of ordinary skill in the art, seeking to determine the scope of the claim in question, had a definitive way to determine the meaning of the phrase "so dimensioned." In the instant application, the scope of the claims actually changes with time and with other variables, as set forth in the rejection above. Moreover, in response to Applicant's argument that the limitations of the claims are clear for those skilled in the art *in light of the specification*, it is noted that the features upon which applicant relies (i.e., a very specific structural arrangement of a particular set of components at a specified point in time) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant argues regarding "reason (a)" of this rejection (that the distribution of temperatures in the plasma or sample chamber, and the distribution of temperature gradients, may vary in the claimed apparatus, depending, for example, on the presence and use of additional structural components; i.e. heaters; the presence of a conduit putting the sample chamber in communication with the plasma chamber) that persons

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skilled in the art would know that once the protection tube is secured in the plasma or sample chamber, neither chamber is opened, and that therefore the apparatus does not undergo any structural change, such as addition or change of any components. This argument is not convincing. The claims recite that the apparatus "comprises" various components. "Comprises" is an open-ended transitional phrase that does not exclude additional structural components from the apparatus. (See MPEP 2111.03.) Thus, the apparatus recited in the claims could include additional structural components that could alter or do away with the distribution of temperature gradients. This causes the recitations listed above to be indefinite, as they have no fixed or defined meaning.

Applicant argues regarding "reason (b)" of this rejection (that the distribution of temperatures in the plasma or sample chamber, and the distribution of temperature gradients, may vary in the claimed apparatus, depending, for example, on the type of processing performed using the apparatus or environmental factors) that even if the distribution of temperatures or temperature gradients change in the apparatus due to the type of processing performed or environmental factors, that the relationship between any two locations in the plasma or sample chamber does not change in terms of magnitude of the temperature gradient. This argument is not convincing, as it is not at all clear that this assertion is true. It is well settled that arguments of counsel unsupported by competent factual evidence of record are entitled to little weight. *In re Payne*, 606 F.2d 303,315, 203 USPQ 245,256 (CCPA 1979). Moreover, as the claims do not recite a structural relationship between the various components (ex. the plasma chamber and the sample chamber, or the protection tube and the plasma source), it is

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unclear that any factual evidence could be presented that would show that the distribution of temperature gradients has a definite meaning in the context of the claims.

Applicant argues regarding "reason (c)" of this rejection (that the distribution of temperatures in the plasma or sample chamber, and the distribution of temperature gradients, may vary in the claimed apparatus, depending, for example, on, the length of time processing has already been performed up to the point referred to as "during the plasma processing") that irrespective of the amount of time that has passed up to the point of time denoted as "during the plasma processing," the relationship between any two locations in the plasma or sample chamber does not change in terms of magnitude of the temperature gradient. This argument is also not convincing, as again, there is no basis to believe that this assertion is true. Again, it is well settled that arguments of counsel unsupported by competent factual evidence of record are entitled to little weight. *In re Payne*, 606 F.2d 303,315, 203 USPQ 245,256 (CCPA 1979). But as in regards to Applicant's argument against "reason (b)" of the rejection, it is not at all clear that any factual evidence could be presented that would show that the distribution of temperature gradients has a definite meaning in the context of the claims. The recitations in the claims represent an attempt to build a structural definition of the arrangement of the pieces of the protection tube based on recitations of intended use that have no fixed or defined meaning.

In sum, the recitations in independent claims 1 and 11 of "a plurality of pieces formed in relation to a distribution of temperatures in the...chamber during the plasma processing," and the recitation that "each of the plurality of pieces is shorter in axial

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length than a piece disposed at a location where a gradient of the temperatures during the plasma processing is smaller” have no fixed meaning, and therefore are still deemed to make the claims indefinite.

In regards to Applicant’s arguments against the rejection under 35 U.S.C. 103(a), these arguments are not persuasive. Specifically, in response to Applicant’s argument that there is no motivation to combine the teachings of AAPA and Carpenter et al. because Carpenter et al. does not teach protecting an inner wall of a plasma chamber against temperature gradients or preventing breakage of the protection tube, the fact that Applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

In regards to Applicant’s argument that the applied combination of the cited references does not teach all of the structural limitations of the claims, and that therefore, *Ex parte Masham* is not applicable in this situation, this argument is not persuasive. As set forth in the previous office action, the recitation that the plurality of pieces is formed in relation to a distribution of temperatures in the plasma chamber during plasma processing, and the recitation that each of the plurality of pieces is shorter in axial length than a piece disposed at a location where a gradient of temperatures during plasma processing is smaller are process limitations, not structural recitations as Applicant asserts. In other words, the recitations in the claims represent an attempt to build a structural definition of the arrangement of the pieces of the

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protection tube based on recitations of intended use. These recitations do not succeed in being structural recitations, since the distribution of temperatures and the distribution of temperature gradients would depend, among other factors, on the presence and/or use of additional structural components (i.e. heaters; the presence of a conduit putting the sample chamber in communication with the plasma chamber), the type of processing performed using the apparatus, environmental factors, or the length of time processing has already been performed up to the point referred to as "during plasma processing." Moreover, as discussed in the rejection under 35 U.S.C. 112, second paragraph, not only are these process limitations, but also limitations with no definite or fixed meaning.

It has been held that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). See MPEP § 2114. See also *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971); *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959); and *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

In this case, the combination of the cited prior art teaches the structural limitations of a protection tube comprising a plurality of pieces disposed in an axial direction, and varying in length. This structure does meet all of the *structural limitations*

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of the claim. The apparatus taught by the combination of the cited prior art would be capable of being operated in such a way and with various environmental conditions and process settings, so as to generate any number of distributions in temperature and temperature gradient, which in turn would be capable of corresponding to a given arrangement of the axial segments of the protection tube.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen G. Arancibia whose telephone number is (571) 272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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